

On The Relationship between Export and Economic Growth – A Look at Malaysian Experience* .

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Abstract

Export led-growth theory identifies export growth as a major source of economic growth. The theory have received some considerable attention over the decades with vast amount of literature were devoted to analyse its empirical relationship. Some attempt has also been made to analysis the relationship between export growth and economic growth in Malaysia (Khalafalla and Webb, 2000 and Reinhardt, 2000).

Undoubtedly, Malaysian export has grown substantially over the period of 1960 until recently. In nominal term, export grew from RM3,208 million in 1961 to RM544,956 millin in 2004. On the other hand, GNP has also grew from RM6,681 million in 1961 to RM 425,060 million in 2004. A striking feature of this relationship is that from 1998 until 2004, the volume of Malaysian exports exceeds the GNP for that period. As a percentage of GNP, export was 128% in 2004.

In the decade of 1960s and 1970s, Malaysian emphasised more on the import substitution strategy. By early 1980s, the drive for industrialisation was intensified. With this new development, the composition of Malaysian export also changed significantly. In the 1970-71 and 1980-1981 period, primary commodities constituted 56.8% and 52.3% of total exports respectively compared to 4.8% and 17.1% respectively for manufacturing output. By 1992-1993, this has changed dramatically to 62.9% manufacturing and 17.6% primary exports.

The study will seek to establish the export led growth hypothesis in Malaysia for the period 1978 until 2002. Employing Pesaran, Shin and Smith (1986) ARDL cointegration technique to established the relationship between export and economic growth we discovered that the hypothesis hold for Malaysia for the period 1978 – 2002.

Key words: export-led growth, economic growth, ARDL cointegration.

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1. INTRODUCTION

Balassa (1985) estimated the effect of exports on economic growth in a production function-type framework in the case of a group of 43 semi-industrialised countries for the period 1973-78 to gauge the effect of 1973 oil shock. This study was an extension of his earlier study of the relationship between export and economic growth for the period 1960-73 (Balassa, 1978). It argued that in a usual production function framework, capital and labours are the main determinants of economic growth. However, this neglect the fact that 'export orientation raises total productivity through its favourable effect on the efficiency of resource allocation, capacity utilisation, economies of scale and technological change' (Balassa, 1985: 23-35) and hence the need to include export within this production-type framework. The study found that the 'rate of growth of exports importantly affected the rate of economic growth' (p: 32). The author argued that the result reaffirmed his earlier study for semi-industrial countries for the period 1960-73.

In another study, Feder (1982) analyses the sources of economic growth for a group of semi-industrialised countries. It found that apart from labour and capital, a reallocation of resources from a less efficient non-export sector to a higher productivity export sector would contribute towards economic growth.

Balassa-Feder works on the relationship between exports and economic growth undoubtedly have sparked the interest in what is to be known as the export-led growth theory. Export led-growth theory (ELG) identifies export growth as a major source of economic growth. The theory have received some considerable attention over the decades with vast amount of literature were devoted to analyse its empirical relationship. Notably among these are the two volumes of Judith A. Giles and Cara L. Williams (2000a, 2000b). Apart from reviewing the literature on ELG, Giles and Williams also reported the findings and the methodology adopted by various studies prior to theirs.

With this background scenario, it is interesting to note the emphasis given by Malaysia on its export sector. In 1968, the Investment Incentives Act was introduced. This Act of Parliament earmarked a new approach towards export-oriented strategy

[Rokiah, 1997]. Over the decades, Malaysian economy has undergone massive structural changes. From a country relying considerably on its natural resources vis-à-vis agricultural produce to a very much diversified economy. Primary commodities consist mainly the agricultural produce, tin, petroleum and gas contributed 77% of total Malaysian exports in 1978 with 21% were derived from the manufacturing sector. By 1987, primary commodities contributed 47% of total export whereas the manufacturing export accounted for 45% of the total export. In 2002, the percentage contribution of primary commodities exports was a mere 10% of the total exports compared to 73% from the manufacturing sector. As Figure 1 shows, the two graphs crossed each other in 1987. M/E refers to the ratio of manufacturing export to total exports and P/E refers to the ratio of primary exports to total exports.

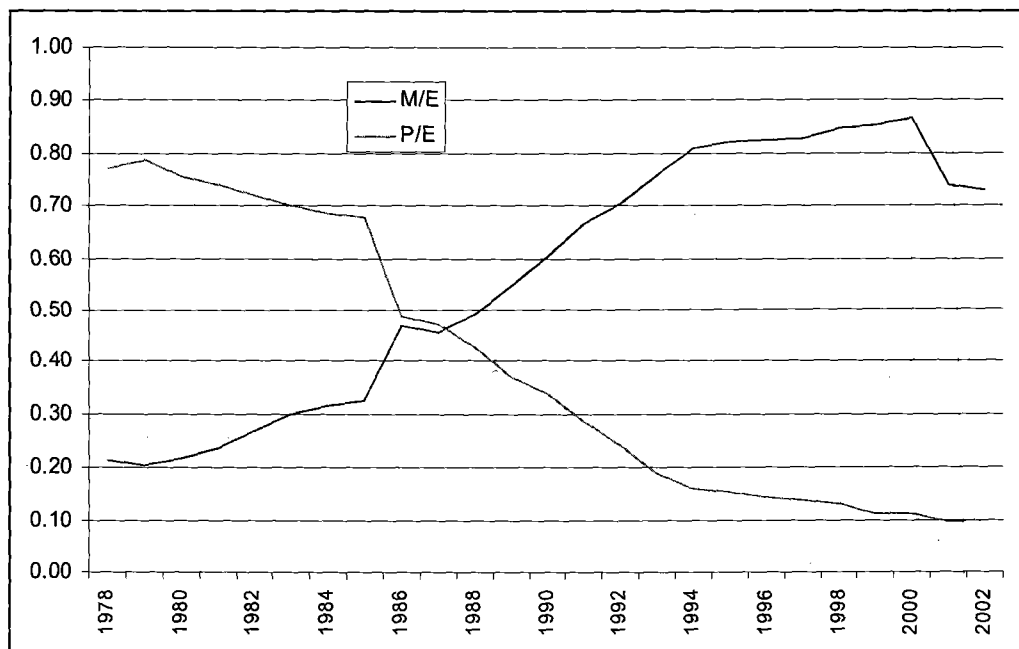


Figure 1

The X-factor : Manufacturing and Primary Export As A Ratio of Total Export.

The present study is divided into five main sections. Following this is the literature review of the ELG hypothesis. In section 3, we report the methodology used while Section 4 discuss the results ad finding made from this study. In Section 5, we present our conclusion.

2. LITERATURE REVIEW

In analysing the growth accounting among Asian countries, Felipe (2003) believed that domestic demand-led growth strategy will fail to generate enough resources to accelerate their development since income levels are still too low among these countries. This suggested that these countries must rely on foreign market to market their product. Felipe also argued that apart from that, the export markets will also allow them to achieve economies of scale. This line of thinking fit well within the ELG theory which suggested that one way for a country to grow is by formulate strategy to expand the export sector thus generating enough income which subsequently have its multiplier effects on the economy. However, as pointed out by Felipe (2003: 1), Blecker (2002 and 2003) provided some counter-arguments against this line of thinking. The later argued that the ELG strategy is doomed to fail due to global demand constraints since 'the market for developing countries' exports is limited by the capacity of the industrialised nations' imports. Viewed in this context, the 'fallacy of composition' (Palley, 2000) will have zero-sum once countries since developing countries compete with each other to gain access to the developed economies market. Another major concern highlighted by Palley is that these countries will tend to 'race to the bottom' implying that in order to gain access to the developed economies market, they tend to neglect such things as work condition and environment.

In establishing the validity of the ELG hypothesis, we are indeed trying to establish whether export growth contributes towards the growth of national income. An overwhelm support for the ELG hypothesis will eventually lead towards adopting an export oriented growth strategy. Nonetheless, the results so far can be best summarised as inconclusive. In this section, we shall highlight some major aspects of the vast literatures on ELG. We did this from three different perspectives – the developed economy, the developing economy and some limited but earlier attempts in the context of Malaysian economy.

Employing cointegration and Granger causality test, Marin (1992: 686) concluded that the hypothesis for ELG cannot be rejected for the United States, the United Kingdom, Japan and Germany. The effect is not straight forward though. Export

Granger-caused productivity gains which in turn lead to the growth in national income. In the case of Canada, also employing Granger causality and cointegration test, Serletis (1992) concluded that the growth of GNP and exports are independent and that the expansion in exports promotes the growth of national income.

Interestingly, Giles *et.al.* (1993) tested the hypothesis of an export-led growth theory for New Zealand at the aggregated level as well as at the disaggregated level. They discovered no support for the ELG hypothesis at the aggregated level but found support at the disaggregated level that is for some exports groups particularly three main group – minerals, chemicals and plastic materials; metal and metal products; live animals and meat.

In the case of Mexico, Thornton (1996) established a significant and positive Granger causality relationship between exports and economic growth for the period 1895-1992. Utilising Johansen techniques in a multivariate framework, Love and Chandra (2005) concluded that in the case of Bangladesh, real income and real export growth are cointegrated but the short-term and the long-term causality runs from real income growth to real export growth thus rejecting the ELG hypothesis.

For a group of 37 developing countries, Jung and Marshall (1985) cast considerable doubt on the validity of the ELG hypothesis. Only in four instances, Indonesia, Egypt, Costa Rica and Ecuador, did they find evidence in support of export promotions strategy for growth.

Applying Sim's unidirectional exogeneity test and Granger's causality test, Hsiao (1987) for four Asian NIC, namely Hong Kong, Taiwan, South Korea and Singapore. The study from the Sims' test does not support the hypothesis that the rapid growth of these NICs arise as a result of a rapid export promotion strategy. Granger causality test indicate no causal relation between export and GDP except for the case of Hong Kong.

In the case of Malaysia, few significant studies have been carried out. Khalafalla and Webb (2000) studied the relationship between export and economic growth for the period 1965 until 1996 using VAR analysis. The study was carried out for the whole

period and for two sub-periods – 1965-80 and 1981-96. The reason for them to divide the period into two sub-periods was that in 1981, the Industrialisation Policy was launched by the government. They concluded that the results confirmed the ELG hypothesis for the full period and for the 1965-80 sub-period. However, test on the sub-period 1981-96 proved a reversed relationship whereby growth caused exports. Keong *et.al.* (2005) tested for the ELG hypothesis but included also the labour force, imports, exchange rate and the East Asian financial crisis as a variable in the analysis. They discovered that exports Granger-caused economic growth for the 1960-2001.

3. METHODOLOGY

Taking the cue from Giles and Williams (2000a) we disaggregate the export variable of Malaysia into two categories following official export statistics, namely the primary sector and the manufacturing sector. The former consist mainly the four major primary commodities – rubber, tin, petroleum and gas. Data are collected from annual Economic Report, various editions, published by the Ministry of Finance.

The time frame for the study is between the years 1978 until 2002. The reason for selecting this time period is that although the aggregated export data can be traced back since 1960 but the official aggregated data can only be reliably assembled since 1978. Furthermore, although the Investment Incentive Act was introduced in 1968, but the Acts itself were amended twice in 1982 and 1986. A look at Figure 1 shows that beginning 1979, a marked growth in the manufacturing export can be seen with a significant jump took place in 1985. By 1988, the ratio of manufacturing export to total exports exceeds the ratio of primary exports to total exports.

Following Pesaran and Pesaran (1997), we performed autoregressive-distributed lag (ARDL) cointegration test to establish the relationship between the variables. The advantage of ARDL cointegration test is that it eliminates the necessary pre-test for the cointegrating properties of the time series. In other words, the ARDL cointegration analysis can be performed regardless of whether the regressors are $I(1)$ or $I(0)$. This also means that the ARDL model allows us to neglect the unit root problems common in time series analysis which is apparently the problem in

estimating Granger-causality and cointegration analysis. Apart from that, the ARDL analysis also allows the derivation of error correction model (ECM) which enables us to balance the short-run dynamics and the long-run equilibrium in the model.

The procedure adopted in this analysis followed closely Pesaran and Pesaran (1997) especially Section 16.5. In this analysis, our ARDL model consists of two (2) repressors', namely the value of primary export and the value of manufacturing export. The ARDL model in this case is given by Equation (1) below,

$$DLY_t = \alpha_0 + \sum_{i=1}^m b_i DLY_{t-i} + \sum_{i=1}^m d_i DLM_{t-i} + \sum_{i=1}^m e_i DLP_{t-i} + \delta_1 LY_{t-1} + \delta_2 LM_{t-1} + \delta_3 LP_{t-1} + \mu_t \quad (1)$$

whereby, LY, LM and LP are log of GNP, manufacturing exports and primary exports respectively; DLY, DLM and DLP are the differenced components of the respective variables.

The null hypothesis in this case is the 'non-existence of the long-run relationship', i.e.

$$H_0 : \delta_1 = \delta_2 = \delta_3 = 0$$

against the alternative hypothesis

$$H_1 : \delta_1 \neq 0, \delta_2 \neq 0, \delta_3 \neq 0$$

The ARDL cointegration model begins by conducting the bound test for the null hypothesis of no cointegration. Pesaran, Shin and Smith (1996) have tabulated appropriate critical values for the bound test and were reproduced as Table F and W in Appendix C in Pesaran and Pesaran (1997). These critical values consists of two sets; one set for assuming all the variables are $I(1)$ and the second set for assuming all the variables are $I(0)$. As pointed out by them, 'if the computed F-statistics falls outside this band, a conclusive decision can be made without needing to know whether the underlining variables are $I(0)$ or $I(1)$. If the computed statistics falls within the band, the result of the inference is inconclusive' (p. 304).

The analysis involves two steps. The first step involves testing the long run relationship between the variables. As specified in equation 1, our main concern is

that export has a significant long-run relationship on income, and hence the dependent variable is the log-differenced of GNP (DLY). The calculated F-statistics will be checked against the critical values given by Pesaran and Pesaran (1997). If the F-statistics falls outside the band, we can reject the null hypothesis of no long-run relationship between LY, LM and LP.

In the second stage, we estimate the ECM coefficient based on equation 2.

$$DLY_t = \alpha_0 + \sum_{i=1}^m b_i DLY_{t-1} + \sum_{i=1}^m d_i DLM_{t-1} + \sum_{i=1}^m e_i DLP_{t-1} + \lambda EC_{t-1} + \mu_t \quad (2)$$

where is the speed of the adjustment parameters. In Microfit 4.0[®], this coefficient is automatically generated based on the model selection criteria chosen. Users are given two options to select the model selection criteria namely the Schwartz Bayesian (SBC) and Akaike Information Criteria (AIC). SBC select lower order lag value compared to AIC as such 'model selected by AIC are considerably smaller given the much higher order ARDL model selected' (Pesaran and Pesaran, 1997: 306).

4. RESULTS AND FINDINGS

In the first stage, we tested for the joint null hypothesis that the coefficients of the variables LY, LP and LP are zero to test the null of 'non-existence of the long-run relationship' between the variables. As suggested by Pesaran and Pesaran (1997), 'if the computed F-statistics falls outside this band, a conclusive decision can be made without needing to know whether the underlining variables are $I(0)$ or $I(1)$.

The calculated F-statistics from the regression performed on this model is 0.77288 which falls outside the bound for the all significance level provided by the Pesaran and Pesaran (1997). Hence, we reject the null hypothesis of no long-run relationship between LY, LM and LP.

The result suggests that the three variables, LY, LM and LP exhibit a long-run relationship. The finding of the existence of a long run relationship allows us to

conclude that the export-led growth hypothesis is applicable in the context of Malaysia.

In the second stage, having established the long-run relationship between the variables, we then estimate this long-run relationship using the ARDL model. At this stage we, we assign 4 as the maximum lag in view of the short period (25 years) that we have in this study. At this stage Microfit 4.0[®], presented us with the choice of different model selection criteria. Table 1 below gives the estimate of the long-run coefficients based on ARDL models selected by AIC and SBC, standard errors in parenthesis.

Table 1
Model Selection : AIC and SBC

Long-run coefficients	AIC	SBC
	ARDL(4,3,4)	ARDL(1,1,0)
LP	-0.41658 (0.18593)	-0.27965 (0.089701)
LM	0.71615 (0.26926)	0.12069 (0.040275)
Intercept	10.2248 (3.0923)	2.4246 (0.67847)

Based on the model selection criteria selected, AIC selected the ARDL(4,3,4) and SBC selected ARDL(1,1,0). It can be seen from table 2, that both the regressors have the expected sign, regardless of the model selection criterion selected. LP have a negative sign and LM have a positive sign meaning that the contribution of primary commodities is becoming less important as compared with the contribution of the manufacturing output on the economic growth of Malaysia for the period analysed.

From here, we proceed to estimate the error correction coefficient. We used only Akaike Information Criteria, since AIC is known as selecting the maximum relevant lag length. This is given in table 2 below.

Table 2
Error Correction Representation of ARDL based on Akaike Information Criterion

Error Correction Representation for the Selected ARDL Model			
ARDL(4,3,4) selected based on Akaike Information Criterion			
Dependent variable is dLY			
Regressor	Coefficient	Standard Error	T-Ratio[Prob]
dLY1	1.1414	.42052	2.7142[.024]
dLY2	-.20956	.26480	-.79141[.449]
dLY3	.56028	.23064	2.4293[.038]
dLP	.0094921	.12305	.077141[.940]
dLP1	.12432	.16440	.75621[.469]
dLP2	.41658	.18593	2.2406[.052]
dLM	-.16972	.11523	-1.4729[.175]
dLM1	-.61584	.23360	-2.6363[.027]
dLM2	-.59181	.31185	-1.8977[.090]
dLM3	-.71615	.26926	-2.6597[.026]
Intercept	10.2248	3.0923	3.3066[.009]
ecm(-1)	-1.0174	.30014	-3.3898[.008]
R-Squared	.89672		
F-stat. F(11,9)	5.5250[.008]		
Residual Sum of Squares	.0082629		
DW-statistic	2.5022		

The error correction coefficient -1.0174 suggesting a relatively high speed of convergence onto the long-run relationship following a divergence.

5. CONCLUSIONS

In this study we attempt to analyse the export-led growth hypothesis in Malaysia for the period 1978 until 2002. The analysis used the autoregressive distributed lag (ARDL) cointegrating procedure first developed by Pesaran, Shin and Smith (1996). We found that the hypothesis is valid in the case of Malaysia for the period under study. Another interesting feature of the study shows that the manufacturing output plays a much significant role compared to the primary output. This can also be seen from the increasing contribution of the sector as shows in table 1.

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